ENERGY STAR HVAC Quality Installation

An Opportunity for Program Savings

Governor's Energy Advisory Committee
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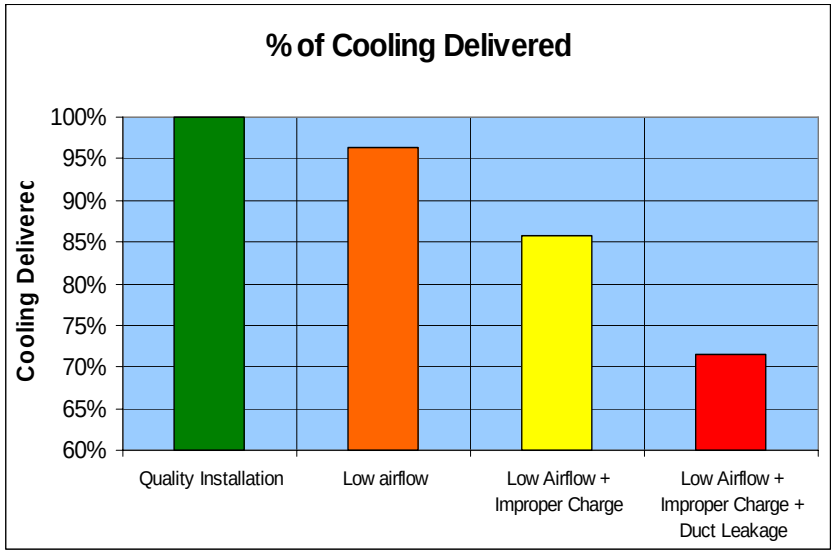
Why EPA is Involved?

- Studies show that half of all air conditioners in U.S. homes perform poorly due to one or more installation issues.
- Raise consumer awareness on the importance of QI and meet expectations
- The ENERGY STAR Brand can influence consumer choices
- NAECA SEER requirements have reduced the energy savings potential from promoting high-efficiency equipment. The ENERGY STAR HVAC QI program provides an opportunity for additional kW and kWh savings.

Potential Losses Caused by Poor Installation

- **Air Flow over Indoor Coil**
  - *(70% inadequate)*
- **Refrigerant Charge**
  - *(62% improperly charged)*
- **Equipment Sizing**
  - ***(****50% oversized)*
- **Duct Leakage is significant**
  - *(Total leakage averaged 35% in the pilots)*

Source: C. Neme, J. Proctor, S. Nadel, *National Energy Savings Potential from Addressing Residential HVAC Installation Problems*, 1999



Installation issues may reduce capacity by up to 30 percent!
Or put another way…

a SEER 13 performs like a SEER 10

Estimated Energy Savings

	Per House
Annual energy savings (KWh)	1300 - 1900 kWh
Estimated peak electricity demand savings (KW)	1 - 1.3 KW

Assumptions:

New system corrects typical install problems

- Duct leakage reduced from 35% to 20%
- Duct insulation increased from R2 to R6
- Proper charge
- Proper airflow
- Proper sizing

Barriers to Market Correction

- Consumers do not know their performance is low (If cold air is blowing they don't usually complain)
- Consumers are unaware that improper installation affects efficiency and comfort (view HVAC similar to an appliance)
- Technicians rely on "rules of thumb"
- "Time is money" business model
- Manufacturer's are willing to absorb warranty claims for units that have failed because of installation issues

ENERGY STAR HVAC QI Guidelines

- Installations under the program must meet the ANSI/ACCA HVAC Quality Installation Specification

- The QI Specification identifies consensus requirements associated with quality installations.

ACCA
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www.acca.org

ACCA Standards are updated on a five-year cycle. The date following the standard number is the year of approval release by the ACCA-EI Standards Task Team. The latest copy may be purchased from the ACCA online store at www.acca.org or ordered from the ACCA bookstore via toll-free telephone at 888.290.2220.

ANSI
www.ansi.org

ACCA Standard

STANDARD NUMBER: ANSI/ACCA 5 QI–2007

HVAC Quality Installation Specification

Residential and Commercial Heating, Ventilating, and Air Conditioning (HVAC) Applications

The Air Conditioning Contractors of America Educational Institute (ACCA-EI) Standards Task Team (STT) develops standards as an American National Standards Institute (ANSI) accredited standards developer (ASD). ACCA develops voluntary standards as outlined in the ACCA Essential Requirements and the ANSI Essential Requirements. ACCA standards are developed by diverse groups of industry volunteers in a climate of openness, consensus building, and lack of dominance (e.g., committee/group/team balance). Essential requirements, standard activities and documentation can be found in the standards portion of the ACCA website at www.acca.org. Questions, suggestions, and proposed revisions to this standard can be addressed to the attention of the Standards Task Team, ACCA, 2800 Shirlington Road, Suite 300, Arlington, VA 22206.

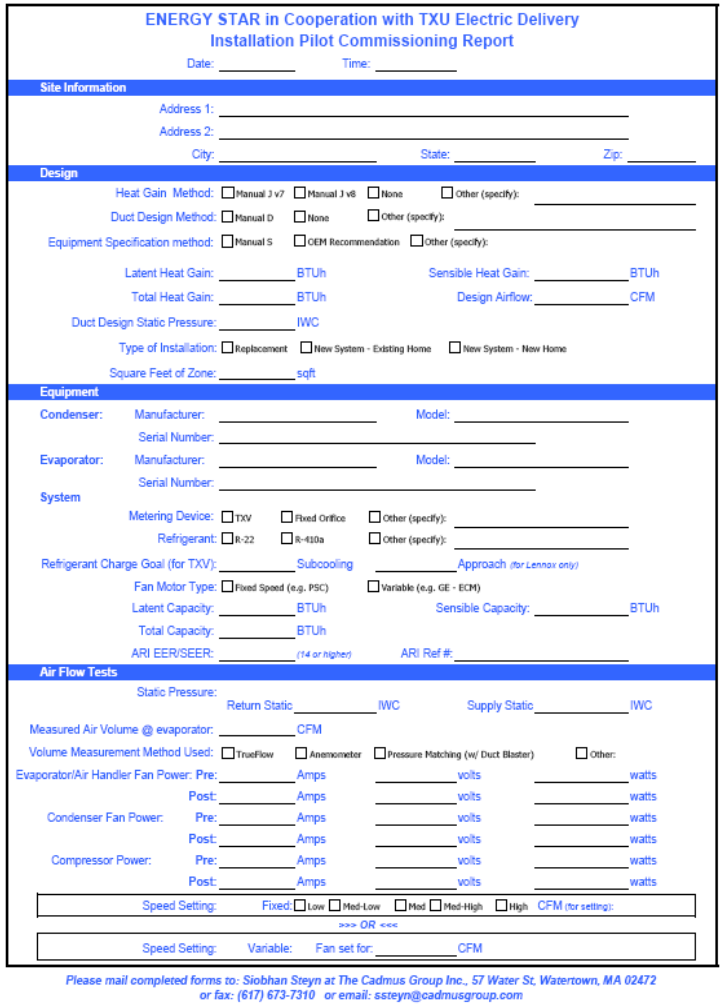
Verification

Level 1 Verification:

Data review of Manual J calculations and commissioning report. The data review will include confirming that all required installation elements were performed using an approved method and check for data inconsistencies

Level 2 Verification:

In-field verification of the installation that follows established protocols.



ENERGY STAR in Cooperation with TXU Electric Delivery
Installation Pilot Commissioning Report

Date: _____ Time: _____

Site Information

Address 1: _____
Address 2: _____
City: _____ State: _____ Zip: _____

Design

Heat Gain Method: ☐ Manual J v7 ☐ Manual J v8 ☐ None ☐ Other (specify): _____
Duct Design Method: ☐ Manual D ☐ None ☐ Other (specify): _____
Equipment Specification method: ☐ Manual S ☐ OEM Recommendation ☐ Other (specify):

Latent Heat Gain: _____ BTUh Sensible Heat Gain: _____ BTUh
Total Heat Gain: _____ BTUh Design Airflow: _____ CFM
Duct Design Static Pressure: _____ IWC
Type of Installation: ☐ Replacement ☐ New System - Existing Home ☐ New System - New Home
Square Feet of Zone: _____ sqft

Equipment

Condenser: Manufacturer: _____ Model: _____
Serial Number: _____
Evaporator: Manufacturer: _____ Model: _____
Serial Number: _____

System

Metering Device: ☐ TXV ☐ Fixed Orifice ☐ Other (specify): _____
Refrigerant: ☐ R-22 ☐ R-410a ☐ Other (specify): _____
Refrigerant Charge Goal (for TXV): _____ Subcooling _____ Approach *(for Lennox only)*
Fan Motor Type: ☐ Fixed Speed (e.g. PSC) ☐ Variable (e.g. GE - ECM)
Latent Capacity: _____ BTUh Sensible Capacity: _____ BTUh
Total Capacity: _____ BTUh
ARI EER/SEER: _____ *(14 or higher)* ARI Ref #: _____

Air Flow Tests

Static Pressure: Return Static _____ IWC Supply Static _____ IWC
Measured Air Volume @ evaporator: _____ CFM
Volume Measurement Method Used: ☐ TrueFlow ☐ Anemometer ☐ Pressure Matching (w/ Duct Blaster) ☐ Other:

Evaporator/Air Handler Fan Power:	Pre:	_____ Amps	_____ volts	_____ watts
	Post:	_____ Amps	_____ volts	_____ watts
Condenser Fan Power:	Pre:	_____ Amps	_____ volts	_____ watts
	Post:	_____ Amps	_____ volts	_____ watts
Compressor Power:	Pre:	_____ Amps	_____ volts	_____ watts
	Post:	_____ Amps	_____ volts	_____ watts

Speed Setting: Fixed: ☐ Low ☐ Med-Low ☐ Med ☐ Med-High ☐ High CFM *(for setting)*:
>>> OR <<<
Speed Setting: Variable: Fan set for: _____ CFM

Please mail completed forms to: Siobhan Steyn at The Cadmus Group Inc., 57 Water St, Watertown, MA 02472
or fax: (617) 673-7310 or email: ssteyn@cadmusgroup.com

Partner with ENERGY STAR

- Implementation guide
- Marketing material
- Sample commissioning and verification reports
- Certificate
- Training for participating contractors
- Well known Energy Star brand